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DERWENT-WEEK: 199539

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TITLE: Information processing appts - performs copying of data
and program from BIOS-ROM unit to RAM unit using access
control mechanism of CPU

PATENT-ASSIGNEE: TOSHIBA COMPUTER ENG KK[TOSHN] , TOSHIBA KK[TOKE]

PRIORITY-DATA: 1993JP-0347248 (December 27, 1993)

PATENT-FAMILY:

| PUB-NO | PUB-DATE | LANGUAGE | PAGES | MAIN-IPC |
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APPLICATION-DATA:

| PUB-NO | APPL-DESCRIPTOR | APPL-NO | APPL-DATE |
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INT-CL (IPC): G06F009/445, G06F012/06

ABSTRACTED-PUB-NO: JP 07191856A

BASIC-ABSTRACT:

The appts consists of a BIOS-ROM unit (3) which stores informations regarding a standard function, an additional function, the font data, the starting routine and a BIOS duplicate routine. All these informations from the ROM unit is copied into a RAM unit (4) using an access control mechanism (2) of a CPU (1). The program counter in the CPU is also updated.

ADVANTAGE - Avoids loss of font data during copying process. Enables normal display of characters during operation using application software.

CHOSEN-DRAWING: Dwg.1/3

TITLE-TERMS: INFORMATION PROCESS APPARATUS PERFORMANCE COPY DATA
PROGRAM ROM

UNIT RAM UNIT ACCESS CONTROL MECHANISM CPU

ADDL-INDEXING-TERMS:

BASIC INPUT OUTPUT STANDARD

DERWENT-CLASS: T01

EPI-CODES: T01-F05B; T01-H01A;

PATENT ABSTRACTS OF JAPAN

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(51)Int. Cl.

G06F 9/445

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(21)Application number : **05-347248**

(71)Applicant : **TOSHIBA CORP
TOSHIBA COMPUT ENG CORP**

(22)Date of filing : **27.12.1993**

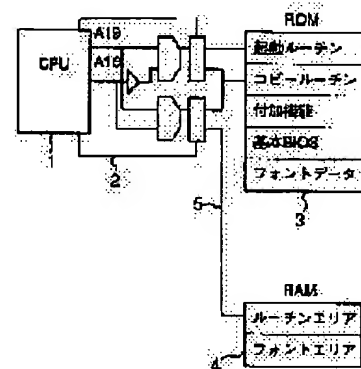
(72)Inventor : **MIYAMOTO KOTARO**

(54) INFORMATION PROCESSOR

(57)Abstract:

PURPOSE: To integrate an additional function into a basic input/output control system (BIOS) area by adopting an access control mechanism for copying or overwriting programs or data, which are stored in a ROM, into a RAM at need.

CONSTITUTION: A start routine inside a BIOS-ROM 3 is started, an input/output device and a memory are tested and initialized at an absolutely minimum, control is moved to a copy routine, and a fundamental BIOS, additional function, font data, start routine and copy routine in a BIOS-ROM 2 are copied to the RAM. Access from a CPU 1 to the BIOS area is switched to access from the BIOS-ROM 3 to a BIOS-RAM 4 by an access control mechanism 2. Next, the start routine on the RAM 4 is executed, and the respective remaining input/ output devices and memories are tested and initialized. Then, the copy routine is executed, and the additional function in the ROM 3 is overwritten to the start routine in the BIOS area.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

LAIMS

[Claim(s)]

[Claim 1] The information processor characterized by to provide the accessor controller which copies or overwrites at RAM the program or the data stored in ROM if needed while changing access from CPU and CPU which reads and performs the program stored in RAM and ROM in which the counterpart of the program stored in ROM and ROM in which a control program or data

is stored, or data is stored, and RAM to Above ROM and RAM.

[Claim 2] It is the information processor carry out overwriting the program or the data which a high order program uses to the program field of the RAM which became unnecessary after system starting after system during starting and a CPU initialize in the check row of hardware according to

the program stored in ROM and initializing in the check row of hardware according to the program

which reproduced to RAM a part of program stored in ROM, changed access to a program area to

RAM, and was stored in RAM as the feature.

[Claim 3] Above ROM is an information processor according to claim 2 characterized by programming and memorizing starting of a system, duplicate, and option portion other than the basic portion which controls I/O, and also memorizing font data and changing.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] this invention relates to the information processor which can assign and use a program or data for the memory which can have only a limited capacity efficiently.

[0002]

[Description of the Prior Art] A microprocessor, LSI for peripheral controls, and Memory LSI come to be supplied very cheaply by progress of semiconductor technology, and the comparatively highly efficient personal computer could be built only by combining these suitably. It is substantially standardized also about software (OS) and the deployment of circulation software is aimed at.

[0003] By the way, the program called BIOS (intercalation output-control system) other than OS (operating system) is used for this seed personal computer controlling a peripheral device.

[0004] Usually, BIOS is stored in ROM with 64KB capacity, and the system starting routine and font data else [for this soma which manages input/output control] are assigned, and it is memorized. In order to include option in the BIOS area of ROM, font data with very low operating frequency is deleted, and the method of adding to the empty area is taken.

[0005]

[Problem(s) to be Solved by the Invention] On the other hand, in order to perform high-speed processing by BIOS, the method of copying BIOS dedicated to ROM to RAM has been taken. In this case, in case BIOS is copied to RAM, the accessor controller for changing access to the BIOS area from CPU from ROM to RAM is used.

[0006] If this accessor controller is used, while the application software (high order software) which uses the font data of BIOS area works, font data to use may not exist in BIOS area, and a normal display will not be performed in this case.

[0007] This invention is made in view of the above-mentioned situation, and it aims at offering the information processor which can include option in BIOS area, without losing font data by adopting the accessor controller which copies or overwrites at RAM the program or data stored in ROM if needed.

[0008]

[Means for Solving the Problem] The information processor of this invention is characterized by to

provide the accessor controller which copies or overwrites at RAM the program or the data stored

in ROM if needed while it changes access from CPU and CPU which reads and performs the program stored in RAM and ROM in which the counterpart of the program stored in ROM and ROM in which a control program or data is stored, or data is stored, and RAM to Above ROM and RAM.

[0009]

[Function] this invention prepares ROM which stored a basic function, option, font data, the

starting routine, and the BIOS duplicate routine, and BIOS-RAM used as a copy place, and when required, it is reproducing one by one, and it offers BIOS area without lack of the font data after system starting. For this reason, system during starting and CPU initialize in the check row of hardware according to the program stored in ROM, a part of program stored in ROM reproduces to RAM, access to a program area changes to RAM, and after initializing in the check row of hardware according to the program stored in RAM, the program or the data which a high order program uses overwrites to the program field of RAM which became unnecessary after system starting.

[0010] This can perform [the application software which was not able to perform character representation normal for a functional addition] character representation now normally conventionally. Moreover, option can newly be included in BIOS area, without deleting font data in this case.

[0011]

[Example] Hereafter, this invention example is explained using a drawing. Drawing 1 is the block diagram showing the example of this invention.

[0012] In drawing, a sign 1 is CPU and serves as a control center of a system. CPU1 reads and performs the program stored in ROM3 and RAM4. A sign 2 is an accessor controller. An accessor

controller 2 performs control which changes access to ROM3 by CPU1 to RAM4.

[0013] A sign 3 is BIOS-ROM, and Foundations BIOS, a starting routine, font data, and option are

stored in this, CPU1 reads each [these] software manipulation routine, and it performs it.

[0014] A sign 4 is BIOS-RAM. 64 K bytes which doubled Foundations BIOS, a starting routine, font data, and option are copied to this BIOS-RAM4 from BIOS-ROM3. A sign 5 is a system bus and CPU1, an accessor controller 2, BIOS-ROM3, and BIOS-RAM4 are connected in common.

[0015] Drawing 2 is drawing having shown memory arrangement of ROM shown in drawing 1 by the tabular format.

[0016] It is as follows when explanation is added per each routine.

[0017] The routine and the starting routine B to which the starting routine A performs the test and

initialization of necessary minimum various I/O devices or memory are the various I/O devices which operate on RAM4, and a routine which performs the test and initialization of memory, after copying BIOS to RAM4. Foundations BIOS, option, the routine by which 64 K bytes with which font data was doubled are copied to RAM4, and the copy routine B of the copy routine A are routines which overwrite the option B mentioned later to RAM4. Option A is an already incorporated function and Option B is a function newly included in BIOS area. Foundations BIOS are the program groups for various I/O device control. Font data A is the so-called low font data of the operating frequency deleted in order that font data with high operating frequency and font data B may incorporate option.

[0018] Drawing 3 is a flow chart which shows operation of this invention example.

[0019] Hereafter, operation of this invention example shown in drawing 1 is explained, referring to drawing 2 and drawing 3 .

[0020] Operations sequence until starting of a system is completed is shown in drawing 3 .

[0021] First, the starting routine A in BIOS-ROM3 starts, and necessary minimum various I/O devices, and the test and initialization of memory are performed. Next, control moves to the copy

routine A and a total of 64 K bytes which doubled the foundations BIOS in BIOS-ROM2, Option A, font data A, the starting routine, and the copy routine B are copied to RAM. Henceforth, high-speed operation is expectable by accessing BIOS-RAM4.

[0022] The change of access is performed using an accessor controller 2. Access to the BIOS area

by CPU1 is changed from BIOS-ROM3 to BIOS-RAM4 by the accessor controller 2. Next, the starting routine B on RAM4 is performed, and the check and initialization of each remaining I/O devices and memory are performed.

[0023] After the above processing is completed, in order to copy font data, the copy routine B is performed. The KOPICHI routine B overwrites the option B stored in ROM3 to the starting routine

B of BIOS area. Since font data is overwritten, the starting routine B which an application program

does not use stops existing on RAM4. However, font data B will be defined here and the normal character representation of the application which uses this data becomes impossible. If overwrite is completed, OS will be started, and starting operation of a system is completed.

[0024]

[Effect of the Invention] According to this invention, the application software which was not able to perform character representation normal for a functional addition can perform character representation now normally conventionally like explanation above. Moreover, option can newly be included in BIOS area, without deleting font data in this case.

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[Translation done.]

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The block diagram showing the example of this invention.

[Drawing 2] Drawing showing memory arrangement of BIOS-ROM.

[Drawing 3] The flowchart in which operation of this invention example is shown.

[Description of Notations]

1 [-- BIOS-ROM, 4 / -- BIOS-RAM.] -- CPU, 2 -- An accessor controller, 3

[Translation done.]

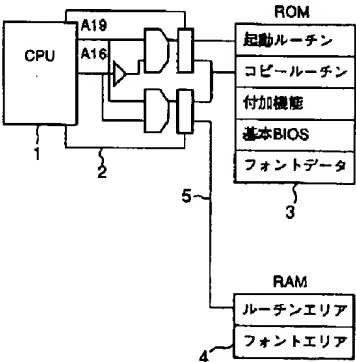
* * NOTICES *

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- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DRAWINGS

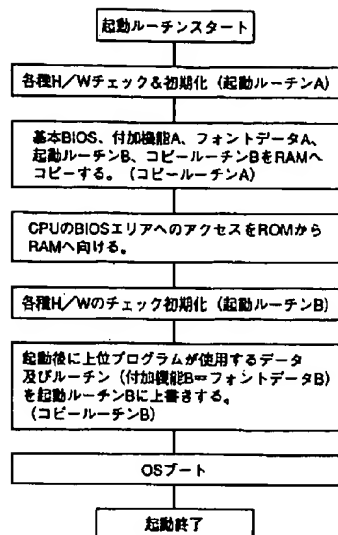
[Drawing 1]



[Drawing 2]

| | |
|---------|----------|
| 起動ルーチン | 起動ルーチンA |
| | 起動ルーチンB |
| コピールーチン | コピールーチンA |
| | コピールーチンB |
| 付加機能 | 付加機能A |
| | 付加機能B |
| 基本BIOS | |
| フロントデータ | フロントデータA |
| | フロントデータB |

[Drawing 3]



[Translation done.]